Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL, AND OTHER IMPROVEMENTS.

VOLUME X.] NEW-YORK MAY 19, 1855. [NUMBER 36.

THE
Scientific American,
PUBLISHED WEEKLY
At 128 Fulton Street, N. Y. (Sun Buildings.)
BY MUNN & COMPANY.

O. D. MUNN. S. H. WALES. A. E. BEACH.

Agents:

Federhen & Co., Boston.	Dexter & Bro., New York.
Stokes & Bro. Philadelphia.	E. G. Fuller, Halifax, N. S.
S. G. Courtenay, Charleston.	S. W. Pease, Cincinnati, O.
Avery Bellford & Co., London	MM. Gardissal & Co., Paris.

Responsible Agents may also be found in all the principa cities and towns in the United States.

Single copies of the paper are on sale at all the periodical stores in this city, Brooklyn, and Jersey City.

TERMS—$2 a-year :—$1 in advance and the remainder in six months.

Sugar Manufacture of France.

France is the largest producer of beet sugar in the world. A favorable soil and climate, and a rural and industrious population, contribute to the successful prosecution of the beet sugar manufacture. This manu facture originated during the reign of Napoleon Bonaparte. His continental system raised colonial produce to an almost fabulous price. The high rate of sugars induced many to look around for the means of producing sugar at home, and an impetus was given to the search, by the offer of a magnificent premium by the emperor to the successful discoverer of a permanent home source of supply. Of all the plants tried the beet proved the most promising, but forty years elapsed before the manufacture of beet sugar was enabled to cope successfully with colonial sugars. From France the culture spread through Belgium, Germany, and far into the interior of Russia, and now there is produced of this kind of sugar on the continent of Europe, three hundred and sixty millions of pounds, nearly one-half of which is manufactured in France, in three hundred and thirty-four manufactories. In the vicinity of Lille the average yield of the sugar beet is sixteen tuns to the acre, and at Valenciennes nineteen tuns. In some localities twenty-five tuns are produced.

From experiments lately made at Cambray and Donai, it appears that the yeast of beet-root employed in the proportion of one-half only, of the quantity used of beer-yeast, produced the some effect in making bread.

[The above is from *The English and American Intelligencer*, published in Paris by Gardissal and Tolhausen. We had no idea that so much suger was manufactured from the beet, 180,000 tuns. We do not know the price at which it can be sold in France, but presume it must be dearer than the cane sugar of America. In England sugar is nearly double the price it is in the United States.

Nashville and Chattanooga Railroad.

The gross receipt of this road for the four months ending March 31, 1855, amounted to $32,000 per month. For the corresponding months last year, the receipts were only $22,000 per month. The average increase per month is $9,677, and the gross increase for the four months is $38,708. And while the receipts have thus increased, the expenses of the road have decreased for the four months $10,000, or at the rate of $3,500 per month.

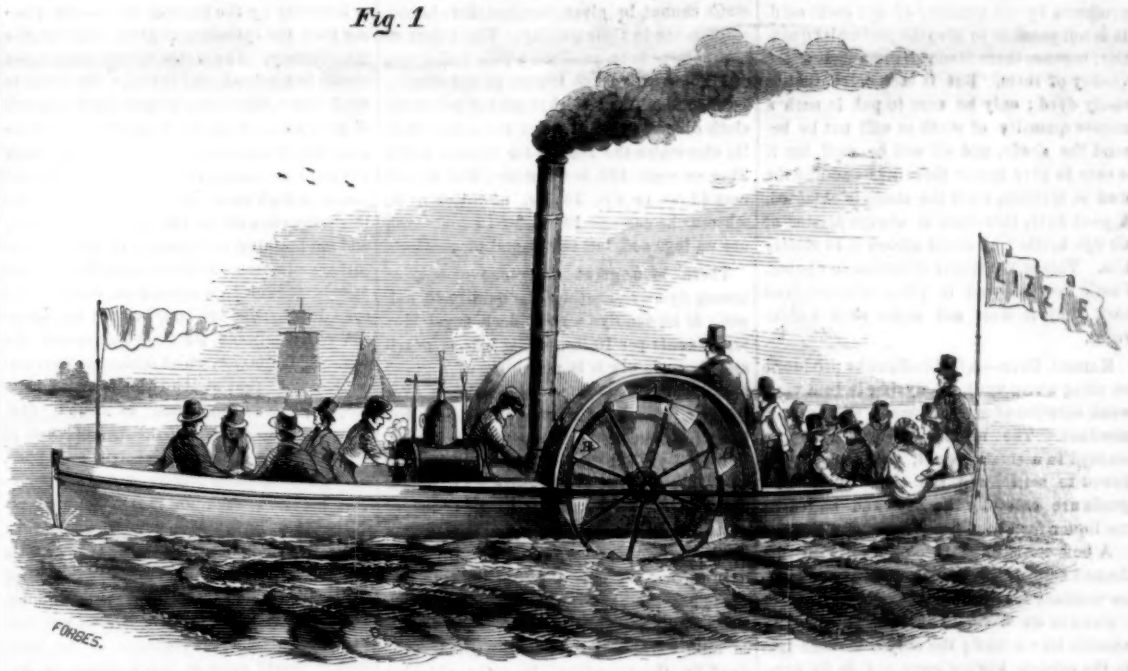
Value of a Pound of the finest Linen Thread.

A single pound of flaxen thread, intended for the finest specimens of French lace, is valued at six hundred dollars, and the length of the thread is about two hundred and twenty-six miles. One pound of this thread is more valuable than two pounds of gold.

The Grand Rapids, Michigan, *Eagle* says an inexhaustible bed of mineral paint has been discovered on the land of Barstow & Smith, known as the Bostwick mill property. It is a very fine article, of a beautiful drab color and pronounced by painters, who have tried it, superior to any article of paint in use.

WALLIS' NEW PADDLE WHEEL.

Fig. 1



The accompanying engravings are views of a new paddle wheel, and its application to the small steamer *Lizzie*, fig. 1, for which a patent was granted to John Upham Wallis, on the 23rd of January last, and for which patents have been secured in most of the European kingdoms. Fig. 2 is a front view of the paddle wheel, and fig. 3 a side view. Similar letters indicate like parts.

A is a wheel to which the paddles B B, are attached. These paddles may be of wood or metal ; they are attached by one side only to the side of the wheel, A, and are to be of trapeziform or trapezodial shape, the end furthest from the wheel being wider than the end which is attached thereto. They are oblique to the plane of the wheel, and are arranged in pairs, one opposite another on opposite sides of the wheel, each pair presenting the form of the letter V, the point of the V being arranged to enter and leave the water first. Their attachment to the wheel is by hinge joints, *b b*. This mode of attaching them serves a double purpose, viz : first, it allows their obliquity to be varied by the screwing in and out of screws, *a a*, against the heads or points of which they are held by the resistance of the water when in operation ; and second, it allows their positions to be exactly reversed when the direction of the revolution of the wheel is reversed. The screws, *a a*, are screwed into the wheel not far from the hinge joints, *b b*, and two sets are provided, one on either side of the hinge joints, so that the paddles may be supported in going ahead or reversing. The paddles are always brought to their own proper position by the resistance of the water, so, as soon as the direction of the revolution of the wheel is reversed, the paddles are reversed by its action. In fig. 2 the direction of the supposed revolution of the wheel is indicated by an arrow.

The action of the paddles is such that they enter and leave the water nearly edgewise, and meet with but little resistance except when they are below the axis of the wheel, and moving nearly horizontally, at which time all the power exerted is effective in propelling the vessel. The attachment of the paddles by hinges, and supporting them near the hinges, gives them such a degree of flexibility or elasticity that when the resistance met with is very great, they will, in some measure, relieve the engine of strain by being drawn towards each other. During last month the steamboat represented made a number of trips on the East River, and created no small stir among those interested in the progress of steamboat engineering. The boat is 32 feet long, 6½ feet beam, and draws 16 inches water. She has an oscillating engine, with a cylinder of 5 inches bore and 10 inch stroke, carrying steam at 120 lbs. pressure. The same boat with the old common paddles made an average speed

Fig. 2

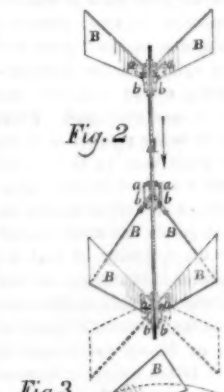
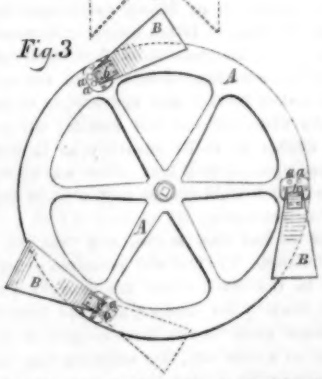


Fig. 3



of about five miles per hour. With these new paddles, carrying fifteen passengers, her speed was increased to about eight miles per hour. It was remarked that no jar was felt when the buckets entered the water, and very little water-lift was observed. Softly and smoothly the little boat glided through the water, to the delight of all on board.

More information may be obtained by letter addressed to E. R. Bassett, General Agent, No. 10 Spruce street, or of the Secretary at the Atlantic Forge, 268 East 11th street, New York.

A Large New Steamship.

Cornelius Vanderbilt—the steamboat king, as he is called—has had the keel of a large steamship for the Atlantic trade just laid.—It will be a larger ship than any of the Collins line. She will be driven by two over-head beam engines, having cylinders of 86 inches bore and 12 feet stroke, which are to be built by the Allaire Works. It is contended that the over-head beam engines are less expensive, and require fewer repairs than the side levers. The experience of the two classes of engines in the California steamers, we have been told, prove this.—They must therefore be more economical. The American beam engine for marine purposes, may yet be adopted by all the seagoing steamers throughout the world.

Tea Hair-Wash.

An infusion of tea, when not too strong, is said to be very useful in preventing the hair falling off. The best plan is to pour boiling water on to the leaves after they have been used for a meal. In ten or twelve hours it may be drawn off, and placed in a bottle for use as required. A table-spoonful of any perfumed spirits may be added to every half pint of the wash. It should be applied to the scalp with a piece of sponge, or a very soft brush. A little glycerine mixed with it, answers the purpose of oil ; its offensive smell is corrected by the perfumed spirits.

The Cork Tree.

The Patent Office has distributed the seed of the European cork tree throughout a number of States, in order to test its adaptation for our climate. This tree, in its native country, is an evergreen, and usually grows to a hight of twenty or thirty feet. The substance familiarly known to us as cork is the outer bark, and sometimes grows two or three inches thick. Should the experiment succeed, it will be the subject of great national importance that plantations should be established in various parts of the country for the purpose of growing this useful substance. If india rubber could be afforded as cheap, stoppers made of it would answer just as well as cork.

The Art of Dyeing.—No. 21.

BUFF COLOR ON WOOL—The goods, whether wool, silk, or cotton, must be perfectly white to receive this color. The most simple method to dye it on wool, is with quercitron bark and cochineal. The dye kettle being perfectly clean, and the water boiling, a very small quantity of the clear liquor of scalded bark (quercitron) is added, and then a snuff—a mere snuff—of ground cochineal; these are suffered to boil for five minutes, when a little chloride of tin and cream of tartar are added, the goods entered, smartly handled, and boiled for twenty minutes, when the color will be complete. The peculiar shade is produced by the quantity of dye stuffs used. It is not possible to give the particular quantity, because there is such a difference in the quality of them. But it is a color that is easily dyed; only be sure to put in such a minute quantity of stuffs as will not be beyond the shade, and all will be well, for it is easy to give two or three dips—adding the stuff in driblets, until the shade is obtained. A good dyer, therefore, is always master of his dye kettle; he never allows it to master him. This is the secret of success in dyeing. Fustic may be used in place of quercitron bark, but it does not make such a clear color.

MADDER BUFF—A fast buff can be produced on clear white wool, by dyeing it in a very weak solution of madder liquor, without any mordant. The madder (crop madder) is scalded in a small vessel, the grounds allowed to settle, and the clear used. The goods are carefully handled and boiled in the liquor for about twenty minutes.

A buff can also be dyed on wool with fustic and cam wood—a small quantity of each, no mordant is required.

SALMON ON WOOL—This color is just dyed exactly like a buff; the only difference lies in the salmon having more red in its composition, it therefore receives more cochineal and that is all. The best way to dye this color is with quercitron bark and cochineal, because it can be toned so easily to any shade with these dye stuffs. Four ounces of bark and a quarter of an ounce of cochineal will dye 10 lbs. of wool a light buff.

BUFF ON SILK.—This color is generally dyed on silk with annotta, and is named "cream color." By handling clean white silk in a weak liquor of annotta, a beautiful buff will be the result. No mordant is required; it is an exceedingly easy color to dye.

SALMON ON SILK—By giving the silk a little stronger liquor of annotta than for the buff, a common salmon color will be the result. If it is required to throw it on a still redder shade than the common color called salmon, wash the silk, and run it, after it gets annotta, through a tub of cold water, made slightly sour to the taste with sulphuric acid; then wash the goods well before drying them. Annotta colors are usually dyed in strong soap suds.

A peculiar kind of buff can be dyed on silk with nitric acid. A clean kettle is filled with water and brought up to a scalding heat, a little nitric acid is then added—about enough to give the water a sharp acidulous taste—then the goods are entered, and handled at this heat, for about twenty minutes. This is also an easy method of dyeing buff on silk.

We have received a letter from Robt. McCafferty, of Lancaster, Pa., in which he states that nitric acid destroys quercitron, and that the nitro muriatic spirits described in article No. 2, for dyeing yellow, are not the proper kind. The acids are entirely changed in their nature by the tin. The best spirit for dyeing bark yellow on cotton, is the sulpho-muriate of tin, and this spirit as a mordant, is mentioned in the article to which he refers. He also objects to the expression, used in one of the articles: "some dyers use a great variety of spirits, but it is all nonsense." He says "no man can dye a purple with red spirits, for the aquafortis has a tendency to brown all colors; spirits of different proportions are used to dye different shades according to patterns." In one of the articles on dyeing, it is stated that the muriate of tin is the best universal kind of spirits to use. A skillful dyer can match different patterns by his dye stuffs and alternants (raisings,) independent of using a great variety of spirits. In the article describing purple, it is stated that many dyers use muriate of tin alone as a mordant. Some also use muriatic acid, saturated with the salts of tin. Different dyers employ different means to match the same patterns. He says he has to dye peach wood reds for 4 cts. per pound, and if he were to give 6 lbs. to the ten of cotton, it would cost him six cents per pound. In these articles, it is stated in a number of places that the exact amount of stuffs cannot be given, because there is such a difference in their quality. The object of each receipt is to produce a rich full color, and not to give the lowest priced shades. Here in New York Market are red colors on cloth differing in price five cents per yard. He also states the receipt for dyeing Royal Blue on page 160, is too dear; that it will cost $1,50 to dye 10 lbs. of cotton by it, whereas he can dye 10 lbs. for 25 cents., and use no logwood, but one pound of pearlash.

There is a great difference of opinion among dyers respecting the quality of colors. If he can dye a good dark royal blue for 25 cents per 10 lbs., using 1 lb. of pearlash, he certainly is in possession of a grand secret, for pearlash at wholesale is over $6 per barrel. He must therefore use but a few ounces of tin and *prussiate*. Smith, in his "Dyer's Instructor," a recent London work, gives 1½ lbs. of the prussiate of potash and 1 lb. of the crystals of tin to 10 lbs. of cotton, or half a pound more prussiate than in the receipt on page 170.

In raising prussian blues (deepening and blooming the shade) silk dyers have been accustomed to use urine and salammoniac, in milk-warm water, after the goods were dyed in the prussiate. It is an old plan with dyers of prussian blues to run the goods through a potash lye, after dipping in the iron.

Mr. McCafferty did not intend his letter for publication; but we have given the substance of it, because of its straightforwardness. He cannot but admit that all the receipts given will dye the specific colors, and good colors too; this is their principal object.

On Steam and Steam Boilers.—[Concluded.]

With respect to the proportion or relative values of the furnace to the other absorbent surfaces, as recipients of heat, there was great diversity of opinion, as much depended upon the quality of the fuel used, and the rate at which it was consumed. There was no fixed rule as to the proportion of the dimension of the grate bars to that of the surface of the boiler exposed to the action of heat; and a series of well-conducted experiments on these points was much wanted, to determine also the quantity of heat absorbed by the surfaces surrounding the furnace, and at different distances, as these surfaces receded from the immediate source of heat. Fourteen or fifteen years ago, he found the mean of fifteen boilers to be nearly as one for the grate bar surface, to eleven recipient or heating surface. This was approximately correct, and appeared to be in use for obtaining the best results; but he had doubts as to its accuracy, as it was formed upon no fixed law. Time was an element which could not be neglected in the combustion of a certain quantity of fuel, and hence we had slow, active, and "excited" combustion. The first was practiced generally in Cornwall, where the draught was kept down by the damper, and the heated currents made two or three circuits of the boiler at a slow rate, thus affording time for the absorption of heat during its passage to the chimney. Stationary boilers received every description of treatment, in all its gradations from slow to active combustion, arising from the want of space or the want of money, or of the inclination to spend it in the construction of new boilers; and combustion was sometimes carried on with such determined energy as to cause an enormous waste of fuel, expensive as regarded wear, and productive of smoke. The marine boiler admitted of no alternative, and the combustion must be active owing to the small space allotted to the boiler; but much might be done to economise fuel, by increasing the areas of the recipient surfaces, which was best accomplished by the tubular system, and a wide diffusion of the increments of heat as they passed from the furnace through the tubes, and thence to the water in the boiler. Excited combustion applied almost exclusively to locomotive engines. The boiler was similar to the multi-tubular; but whilst, in one, the fire was supplied with oxygen by the rarified draught of the chimney, in the other it was excited with much greater intensity by the blast of the steam passing from the cylinders at great velocity into the chimney. The steam operated upon the smoke box behind, and through the tubes to the furnace, like a pump, and rapid currents of cold air blew up the furnace when the engine was in motion; therefore, "the faster she goes the harder she blows"—(laughter)—and at high speed such an engine had all the properties of the blow-pipe, in exciting and maintaining an intensity of heat in the furnace almost sufficient to melt the hardest metals, producing a white heat, which would soon destroy the fire-box, but for the great difference between its temperature and the water in the boiler, which seldom or ever exceeded 400°, that of the furnace being probably as high as from 1,500° to 2,000°. Owing to this intense heat, the furnace had to be surrounded with material such as copper, of high conducting powers, and other recipient surfaces, such as the tube, these required to be as thin as possible, to save time in the transmission of heat, and to effect a rapid evaporation from the water contained in the boiler. The difference, therefore, between locomotive and other boilers was, that time was of more importance, as the locomotive would raise as much steam in one hour, as a stationary or marine engine boiler would raise in twenty; the former requiring 15 square feet of fire bars, and the latter 300 square feet, being in the proportion of 1 to 20. The subject deserved careful investigation; and we might reasonably hope to gain advantage from a principle only partially developed as yet. Safety-valves had occupied much attention; but the projects put forward, though exceedingly ingenious, were not self acting and free from risk. There were nearly 20 different ways of feeding a boiler. In Watt's days, a pump supplied a cistern ten or twelve feet above the boiler, which hight measured the pressure of steam within. Now, the altitude of a column of water must be measured by the hight of the chimney, which was too expensive and inconvenient for high pressure steam. The only alternative was a pump powerful enough to overcome the resistance of the steam, and to regulate the supply in such a way by the admission valves, as would cover the flues and maintain the water at a fixed and uniform hight. This was accomplished in several ways, with appendages which, though not necessary, did no harm if kept clean and in working order. Working steam expansively was one of the most important subjects to which the engineer could direct his attention. The difference between high and low steam was the measure of elasticity and temperature, when taken at the extremes at which it is worked, from 10 lbs. to 150 lbs. on the square inch. When the steam impinges upon the piston at 10 lbs., it follows up the supply and pressure continually throughout the whole length of the stroke, or nearly so; but steam of greater density, instead of pressing upon the piston with a continuous flow, had its communication with the boiler intercepted at a particular point of the stroke, and the steam thus cut off was left to perform the remaining portion of the stroke by its own initial or elastic force, dilating or expanding as the piston moved. This was the theory of what was technically called working steam expansively. There was no calculations founded upon experimental facts respecting the value of the system. He, however, demonstrated that, with an engine of six feet stroke cylinder 40 inches diameter, and cutting off the steam (40 lbs. on the square inch) at one sixth of the stroke, it did rather more than one-half the duty with one-sixth the quantity of steam that would otherwise be used, or above three times the work. It was important to attend to the perfect combustion of fuel, and the transmission as well as the retention of heat, as it was evolved in the process, and also to maintain cleanliness and order about a steam engine and a boiler.—In a well-managed concern, safety valves and feed pumps were not allowed to continue out of repair, and there was no tampering with such vital organs of safety. Everything was in its place, and was kept in the most perfect order, well oiled and well cleaned, so as to be at all times ready for service. With respect to the steam engine also, the same regularity and system of management was preserved; and the result was a beautiful piece of machinery working with a degree of precision at once the admiration of the employer and the pride of the engineer. He would have all the engines kept in this style. Hence the advantage of polished surfaces and the mathematical exactitude with which the steam engines of the present day were executed. A well constructed machine, neatly executed, had a wonderful effect upon the mind of its keeper. It only required a few months to accustom him to habits of cleanliness and order; and it improved his taste and elevated his mind to see his pet engine with the arms of a giant, finely polished, overcoming the resistance of a thousand horses, and impelling with the same apparent ease a floating citadel or a ponderous train. In conclusion, he would quote the words of a distinguished writer, who, in speaking of the steam engine, said—

"It is stupendous alike for its force and flexibility, for the prodigous power which it can exercise, and the ease, and precision, and ductility with which it can be varied, distributed, and applied. The trunk of an elephant, that can pick up a pin or rend an oak, is nothing to it. It can engrave a seal or crush masses of obdurate metal like wax before it; draw out, without breaking, a thread as fine as a gossamer; and lift a ship of war like a bauble in the air. It can embroider, forge anchors, cut steel into ribbons, and impel loaded vessels against the fury of the waves."

It could do all this, and more, since the eulogium was pronounced; and he looked forward to the time when still greater impossibilities would be effected in the action of the steam engine and the use of steam.

Street Sweeping Machines Triumphant.

The street sweeping machines employed in this city, are fast winning their way into public favor in spite of much opposition. They do their work so well, and so rapid, that they have set competition to the "wheel-about march and retreat."

It is now contemplated by the owners of these machines to sweep the streets during night; a good and grateful move to all our citizens. This we advocated years ago, when all the work was done by hand labor; we are glad to see the machines taking upon themselves this improvement; success to their iron legs.

We have also advocated for some years, the paving and repairing of pavements during night; this reform we also hope to see carried out at no distant date. The annoyance to pedestrians and equestrians, from repairing streets, is a grievous complaint. The loss from blockaded streets, by thousands of carriages and carts having to bend their courses down by-ways and highways, costs the inhabitants fifty times more every year, than the small extra expense that would be incurred for the change from day to night paving. See to this, city fathers; carry it out, and for your welfare our carmen and citizens will ever pray.

Rapid Riding.

The train which conveyed the Emperor Napoleon to Windsor on their recent visit to England, ran at the rate of 72 miles an hour. The distance was 28 miles. Brunnell, the great engineer, managed the locomotive

(For the Scientific American.)

Perpetual Motion, and Propulsion by a Wind Mill.

Your correspondent, G. W. Steadman, on page 227, SCIENTIFIC AMERICAN, denies being a "perpetual-montionite," but at the same time his argument and illustration evince the holding of ideas, which, if true, would lead to perpetual motion. He has stated, in imagination, a wind wheel, with sails moving as fast as the wind, and at the same time the wind pressing against them with as great a force as if they were held at rest. Now, if his sails should move half as fast as the wind, 6 miles per hour, the wind would strike them with a velocity (12—6)=6 miles per hour; and the backs of the sails, in returning below the top of the boat, would strike against the dead air with a similar velocity. Therefore, when the sails move half as fast as the wind, an equilibrium will subsist between the force of the wind against the sails, and the re-action against the backs of the returning sails; and no power can be derived from it. But let the sails move one-third as fast as the wind (12÷3) =4 miles per hour, then the wind will strike them with a velocity (12—4)=8 miles per hour. And, from a well known law of moving fluids, $12^2 : 500 :: 8^2 : 222{\cdot}22$; and $12^2 : 500 :: 4^2 : 55{\cdot}55$. Here the pressure of the wind against the sails will equal 222·22 lbs.; and the re-action against the returning sails will equal 55·55 lbs.; and the effective force of the wind against the sails (222·22—55·55) =166·67 lbs., moving 4 miles per hour, in place of 500 lbs. moving 12 miles per hour, as he has it. And if geared, as he proposed (4 to 1) it will give (166·67×4=666·68 lbs. moving one mile per hour, instead of 2,000 lbs., moving 3 miles per hour—only about one ninth part of the power that Mr. S. estimates.

The resistance to paddles moving through the water at the rate of one mile per hour, is about equal to 2 lbs. per square foot; hence. if he should have have 333·34 square feet of paddles in the water, moving one mile per hour, the resistance would be (333·34×2)= 666·68 lbs., and his boat would lack a force (1000—666·68)=333·32 lbs., to hold it from drifting with the wind, or moving backwards.

The above calculation is based on the supposition that all parts of the sail move as fast as the outer verge. If a correct calculation were made (which is too complicated and not necessary, at the present,) the useful effect would be found not to exceed one half of that indicated above.

The following may be useful to Mr. S., viz.: If the square of the velocity in feet per second of a current of air impinging perpendicularly against a fixed plane, be multiplied by ·002288, it will give the pressure in pounds per square foot. If the direction of the current is not perpendicular to the plane, the velocity in the direction of a perpendicular will be the actual velocity, hence, the velocity of the wind multiplied by the sine of the angle of its direction with the plane, will give the effective velocity. J. B. CONGER.

Jackson, Tenn.

P.S.—The above was written on the appearance of the article criticised, and thrown aside without an intention of sending it to you. But on the appearance of your reply in the last number to my former communication on the subject, and seeing from your reply to G. W. S., in the same column, that he still insists on driving his boat against the wind, I concluded to send it on. I did not clearly convey my idea in the former communication. I should have said, experiment or demonstration from known principles of moving fluids by taking a particular case. The above is a demonstration of a particular case, showing most conclusively that the vessel, so far from moving against the wind, would float backwards. E.B.C.

The city of Chicago is the greatest grain port in the world. From it there were exported 13,726,728 bushels in 1853. Twenty-two years ago, grain was imported into that city for home consumption. The young giant of the West has made mighty strides in agriculture in a score of years.

Illustrating Patent Office Reports.

MESSRS. EDITORS—The last number of your valuable journal contains a notice in reference to an article on "Illustrating Patent Office Reports," which has previously appeared in the New York *Tribune*. The article in your columns says that the illustration of the annual report by copper or steel engravings, would impose upon the inventors an increase in the Patent Office fees of about two hundred and seventy dollars in addition to the present fee of thirty dollars This is a serious mistake, which I have no doubt you will not hesitate to correct after having taken notice of the followiug:

The Patent Office Report for 1854, which is at present being printed, will be accompanied by a volume of plates illustrating all the patents issued during the year. These illustrations have been engraved not on wood but on copper plates, by order of the present Commissioner of Patents, he having adopted this plan, we have reason to believe, after the most careful consideration, and comparison of all the arguments for or against it, and the expenditure connected therewith.

It is but reasonable to suppose that Judge Mason, whose energetical and sagacious administration of the Office has been gratefully and universally acknowledged by the public as well as the inventors themselves, has also in this particular instance, not failed to act with his usual forecast and consideration of the interests of inventors and public.

Congress had been applied to for an appropriation for the printing of these plates, but the session closed before the matter was discussed. Thus the drawings are at present being copied on wood, on the old plan, and the plates to be printed therefrom.

If the copper plates had been printed, the cost would have been little more than one dollar per complete volume of illustrations.—If eighty thousand copies had been taken, a number which is far beyond the number of actual readers, and if the whole expenditure were to be charged upon the inventors, it would only increase the present fees by forty dollars instead of two hundred and seventy.

M. C. GRITZNER.

Washington, D. C., May 4, 1855.

[The New York *Tribune* of the 7th inst., alluding to our article on the above subject (on page 269) says, "we did not state that Patent Office illustrations could be rendered more cheaply on copper or steel than wood." This is true so far as direct words are concerned, but from the tenor of the *Tribune's* article, we could draw no other inference than that it considered steel plate illustrations of the Patent Office Reports the *cheapest plan*. The *Tribune* seems to be an interested party, for it says, "WE had engravings on copper plates prepared under his personal (the Commissioner of Patents) supervision, in appropriate style, and faithfully representing all the patented details of the machines on which letters patent were granted during 1854." It then gives the information contained in the above letter respecting Congress adjourning without making the appropriation for printing.

Our Washington correspondent is mistaken respecting our ever having stated that the illustration of the annual Patent Office Reports by copper plate engravings would impose upon inventors the increase of fees mentioned. We stated "it would require the Patent Office to have a revenue ten times as large as it now has, *to illustrate all the patents correctly by steel plate engravings.*"

The great increase of expense for simply printing copper plate engravings is set forth in our correspondent's letter, by the necessity of transferring the copper plates (although prepared) to wood.

Our correspondent admits, that if the expense of copper plate engravings were charged upon patentees, their fees would be increased to $70. We stated in our article referred to, we would like to see "good illustrated reports of the Patent Office," but we do not wish to see any system that would tend to increase materially the patent fees to inventors; and we are positive that if a system were adopted like that so hastily considered and recommended by the *Tribune*, the very great increase of expenses to the Patent Office, or the National Treasury, would soon lead to a demand for such an increase of fees, not from $30 to $70 merely, but to four times seventy dollars.

New Gas Regulator.

The apparatus of George B. Woodruff and James N. Palmer, of New Haven, Conn, for equalizing the flow of gas, for which a patent has been granted this week, has two cylinders, one arranged within the other, and having communication all round the bottom, making them equivalent to an inverted syphon. There is a space between the two constituting an air chamber, having communication with the atmosphere through two small tubes at the top. The interior of one cylinder is the gas chamber. This chamber is always filled with gas, and the pressure is the same as in the pipe. The valves of the inlet and outlet tubes are conical and close downward; they are attached to a rod which has a float on it, resting on the water in the lower part of the gas chamber. The gas and air chambers are filled with water to such a hight as to give the valves a full opening when the burners are all open and the pressure lowest. As the pressure in the pipe tends to increase by pressure on the main, acting on the inlet, or by shutting off some of the burners, acting on the outlet, the pressure in the gas chamber increases and acts on the surface of the water, depressing its level and forcing it into the air chamber, when the float of the valves falls and contracts the gas openings. When the pressure of the gas diminishes, the contrary effect is produced, and thus the pressure in the pipe which supplies the burners is rendered uniform.

The patent embraces three claims; we have only presented the nature of the first, and a very good idea of the nature and importance of the other two is obtained from the claims themselves.

Wind Mill.

The improvement in wind mills, for which a patent has been granted this week to A. Lempeke, of Pa., consists in the peculiar means employed for regulating the velocity of the mill; also a device for stopping it.—At the end of the top horizontal shaft there is a hub in which are the radial arms to which the sails are attached; these arms are allowed to turn in the hub. A collar with a circular rim is secured on this shaft, and to it chains are connected which extend to the side rods of the sails. There is a balance regulating weight connected to levers to keep the sails in such a position as to present the requisite surface of them to the wind; and one lever can be easily raised or lowered by a pin, so as to turn the sails more or less towards the wind, to obtain the desired velocity. By simply pressing the foot upon a step, a lever is depressed, which by its connections, operates the collar with the chains attached to the sails, by which their edges are turned towards the wind and stops the mill.

Silvering Looking Glasses.

The invention of Joel Webster, of Brooklyn—whose claim is on another page—relates to silvering the common kind of looking glasses, which, on account of their unevenness of surface, will not bear pressure upon a hard, flat table, such as is employed in the silvering of plate glass. The apparatus consists of two tables with elastic faces, one to receive the silvering preparation and the glass, and the other to receive and transmit the necessary pressure to the glass.—These tables are connected in such a manner as to facilitate the operation as much as possible.

Machinery for Making Plaited Twist or Cord.

The invention of W. H. Zahn, of this city, for making the above named cord, for which a patent has just been issued, consists in certain means whereby cotton or flax may be covered, or as it is termed "plaited," with silk or worsted; or by which any fibrous material may be covered with a like or different material, and afterwards laid so as to make cord at one operation. It is not possible, without diagrams, to give a clear idea of the construction of the different parts of the machine, suffice it to say therefore, that it makes the strands, covers them, and lays the cord at one continuous operation.

New Faucet for Water Pipes.

The new faucet of Wm. Fowler, of this city, for which he has just obtained a patent, consists in making the upper or top part of the pipe, which receives water from below, with a socket in it, and a valve seat placed therein with a side opening in it, communicating with the water passage below. The faucet has no tap, but is simply a small pipe with a bent spout or nozzle, and closed at the bottom, but has a side opening to communicate with the opening of the water vent in the valve seat. This faucet is screwed into the valve seat, and by turning it round to bring its opening to coincide with the valve seat opening, the water will flow out of the nozzle, and by turning it in the contrary direction the water passage is closed. The seat of this faucet is packed, and by its construction it cannot leak like a stationary faucet with a movable tap. The nozzle is set so as to be above a basin when the water is drawn off.

Window Sash Fastener.

The nature of the improvement on window sash fasteners, for which a patent has been granted this week to Chas. R. Rode, of this city, consists in having a rod inserted longitudinally in the lower cross pieces of the sashes, and having pawls attached to each end of the rod, which catch into racks secured in the frame. The rod mentioned is provided with a thumb piece to turn it, and by which the pawls are thrown from the racks when required. The pawls catch into the rack, and retain the window in position at any point of elevation desired. It is a sure and simple fastener.

Improved Tape Fuse.

The patent granted to Phillip Bacon—the claim of which is on another page—relates to the fuse for blasting purposes under water, or where a water proof fuse is required. The tape fuse, as commonly constructed, consists of the common fuse covered with a strip of some woven fabric made water proof with pitch or tar. In cool weather this covering becomes hard and brittle, and in uncoiling the tape bocomes loose in parts, and fails to give protection. To obviate this, the new fuse is wrapped on the outside with a thread or roving, by which means the cracking off of the water proof materials is prevented; and at the same time, one tape, instead of two, as now used for a covering, will answer every purpose.

Adjusting Window Sashes.

The patent granted this week to Lyman E. Payne, of Yazoo City, Mississippi, embraces having beveled strips attached to the inner sides of the casing, and having rebates cut in the sides of the stiles of the sashes, in which rebates the beveled strips fit, so that when the sashes are closed they are rendered perfectly tight, and will still move freely when raised or lowered. The object of the improvement is to render sashes perfectly tight within their frames, so as to exclude dust, &c.; something long and much desired.

Lake Phenomenon.

On the 25th ult., a huge wave seven feet high suddenly arose on Lake Ontario, and rolled upon the shore at Port Dalhousie, sweeping over the piers with great violence. When it receded, the waters run out from the shore, leaving great quantities of fish floundering on the beach. For some time afterwards the waters of the lake arose and fell repeatedly, until they seemed to have expended the strength of the first impulse, which is supposed to have been caused by a whirlwind that passed in a narrow track partly over the lake and a long strip of the country.

Hot Air Engines Again.

We have been reliably informed that Capt. Ericsson is building two new hot air engines, but for what purpose we have not been able to learn.

New Inventions.

Grain and Grass Harvesters.

Improvements in harvesting machines are not yet ended, as will be seen by the claim of the patent on another page granted to T. W. Lupton, of Va. The machine combines rotary cutters with wire fingers, reel, and endless receiving aprons. The fingers bend the grain at an angle at which it is swept and cut by the cutters, conveyed away by the aprons, and deposited on the ground.—The aprons are dispensed with in cutting grass.

Turpentine Distilling Apparatus.

The claim on another page, of a patent granted to A. C. Blount, of Mount Pleasant, Ala., for an improved apparatus for distilling turpentine, relates to the straining of crude turpentine, prior to its distillation.

The crude turpentine is placed in a cylinder surrounded by a steam jacket for heating it, and containing cylindrical wire sieves placed one within the other. When subjected to heat, and melted, it flows out into a receiver, by gravitation, screened of all its dirt and impurities, and is connected with the still by a pipe, into which it is drawn as required.

Improvement in Flour Bolts.

The annexed engravings represent an improvement in Wire Cloth Flour Bolts, for which a patent was granted to Elias Nordyke and F. B. Hunt, on the 6th of last February.

Figure 1 is a longitudinal section of the flour bolt—the plane of section being through the center, and figure 2 is a detached section of the device by which the pressure of the brushes against the wire cloth of the bolt is graduated.

The nature of the invention consists in the peculiar device employed for expanding and contracting the rotating brushes which act against the inner surface of the wire cloth of the bolt, and force the flour through; the brushes bearing against the wire cloth, with a greater or less pressure according as they are adjusted.

A represents a wire cloth bolt of the usual cylindrical form, which is placed stationary within a chest or box, B, the bolt being formed of cloth of different degrees of fineness, as indicated by 1, 2, 3, 4, and 5.

C represents a shaft which runs longitudinally through the center of the bolt, A, and has its bearings, *a a*, on the framing of the chest or box, B. On one end of this shaft at the head of the bolt, there is placed a driving pulley, D. At each end of the shaft, C, there is permanently secured a hub, *b*, having radial arms, *c*, projecting from it, the ends of said arms being forked, and having bars, E, loosely fitted in them, on the outer ends of which bars brushes, F, are secured

On the outer edges of the arms, *c*, and near their ends are slides, G, one to each arm, said slides working within small guides, *d*, attached to the arms, *c*. The outer ends of the slides, G, are attached to the brush bars, E, and the inner ends are attached by pivots, *e*, to the upper ends of arms, H, the lower ends of said arms being secured by pivots, *f*, to a hub, I, placed loosely on the shaft, C. The hubs, I I are kept in proper position upon the shaft, C, by a small rod which passes through one of the hubs, *d*, of the arms, *c*, and through the hub, I, this hub being prevented from moving by nuts, *h h*, on the rod, which nuts are at each side of an ear, *l*, on the hub, I, fig. 3.

J, fig. 1, is a rod which passes through both of the hubs, I I, and having a screw thread cut on its inner end working on the hub, I, at the head of the bolt.

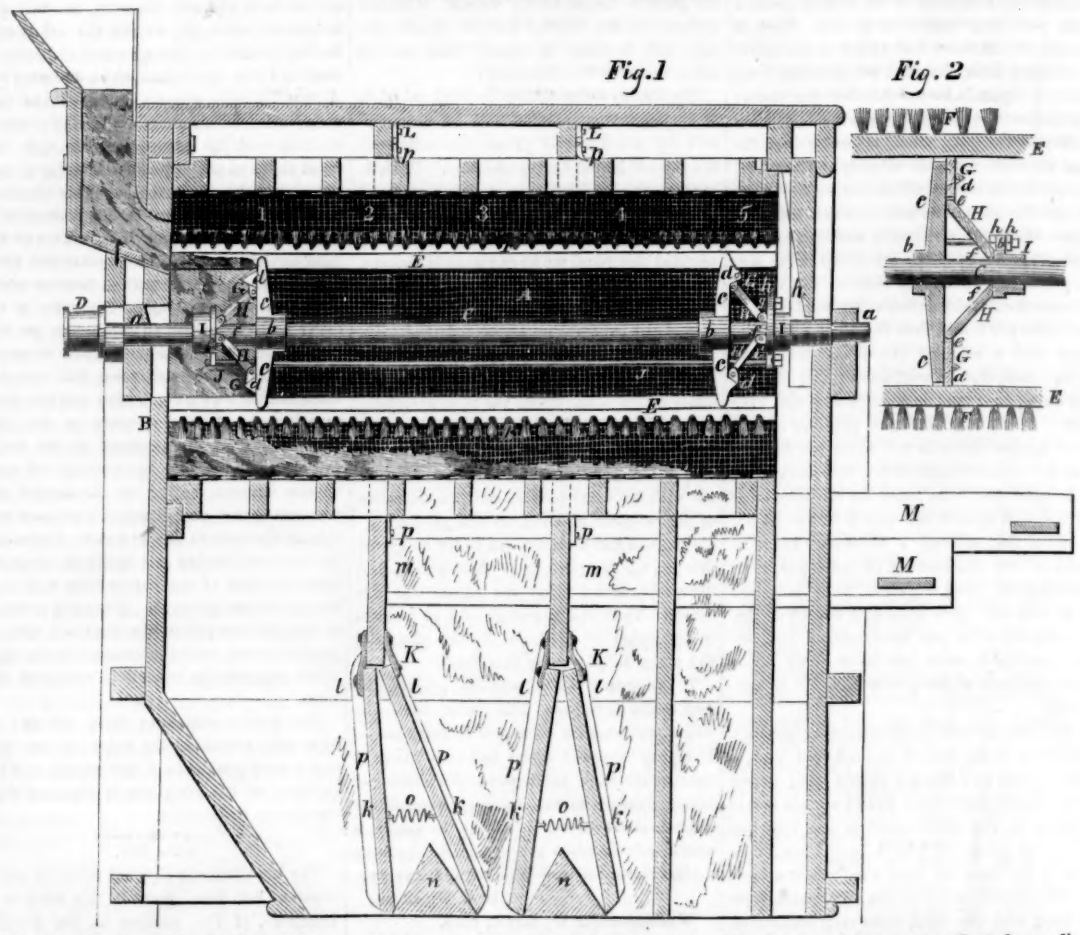
K are spouts, or rather the divisions of spouts which are attached to the lower ends of hoops or rings, L L, which encompass the bolt, A. To these divisions, K K, there are attached slides, M M, one to each, the slides projecting through the chest or box, B, at the tail of the bolt. The divisions, K K, and hoops or rings, L L, form perfect divisions or compartments within the chest or box, B, and prevent the flour from one division passing into the other. The lower ends of the divisions, K K, are formed each of two parts, *k k*, the upper ends of which are attached by straps or hinges, *l*, to projections, *m*, secured to the lower parts of the hoops, the lower ends of the two parts af each division fitting over triangular projections, *n*, at the bottom of the chest or box, B, the lower ends of the parts, *k k*, being kept against the projections by spiral springs, *o o*. The hoops or rings, L L, on their inner edges, are provided with india rubber strips, *p*, in order to make a tight joint between the bolt frame and hoops or rings. The outer edges of the upper halves of the hoops or rings are also provided with strips, *p*, as also the edges of the division plates, K.

Operation—The meal or unbolted flour is admitted into the head of the bolt, A, which is elevated about one inch to the foot, and motion being given the shaft, C, the flour is brushed through the bolt or wire cloth by the brushes F, the pressure of said brushes against the wire cloth being graduated as desired by operating the rods, *g* J, by which the nuts, I I, on the shaft, C, may be moved, and the brush bars, E, expanded or contracted. The finest flour falls through the portion of fine wire cloth, numbered 1 and 2, and by moving the slide to which the first division plate K, is attached the flour receptacle is enlarged or contracted so that only the first quality may be received in the flour receptacle. The same operation may be applied to the plate, K.

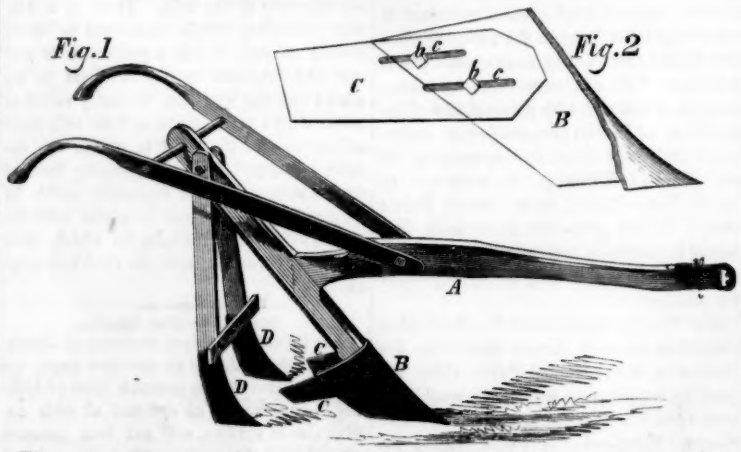
By the use of the sliding division plates, the flour may be separated at varying points as also the ship-stuff, and inferior boltings towards the tail of the bolt. And as wheat differs much respecting the quality and quantity of good flour it will produce or yield, the division plates may be adjusted according ly, so as to keep the fine portion separate from the rest.

More information may be obtained by letter addressed to Nordyke, Ham & Co., Richmond, Ind.

IMPROVED FLOUR BOLT.



HORSE SHOE CULTIVATOR PLOW.



The accompanying engravings represent a cultivator, for which application for a patent was made at the same time by two different inventors, viz: W. S. Hyde, of Ohio, and H. Wright, of South Byron, N. Y. A compromise was finally made, and the patent was issued in Mr. Hyde's name, in June, 1853, but H. Wright is now the sole owner of a large portion of territory in the Eastern and Western States.

Fig. 1 is a perspective view, and fig. 2 is a section, showing one of the adjustable wings connected with the plow shoe. A is the beam. B is the plow shoe. D D are two adjustable cultivator teeth, behind the shoe, and C C are the adjustable wings. In fig. 2, *c c* represent two slots in each wing, and *b b* are screw bolts to secure the wings in these slots. The wings, C C, are flaring, and are designed for hilling up, consequently, as they can be adjusted by the slots, *c c*, and the bolts, further in or out on the plow shoe, they are rendered fit to hill up high or low, and made suitable for narrow and wide rows. The bar which connects the two cultivator teeth, D D, has bolts which also work in slots in their respective legs, and they swivel at the top, consequently they can be set near and wide apart, to cut as close to the rows as may be desired.

To use this plow cultivator, the ground should be plowed deep, well harrowed, and marked both ways with a good marker. As soon as the rows can be seen, commence using the implement. Take off the wings from the shovel, and not use them while the crop is small. Set the teeth to run as near the hills as possible; to work fast have a man or boy follow while crossing, when the corn is small. As soon as the corn is a foot or more high, put on the wings, and set them level on the lower edge, and as the crop grows, set the hind teeth nearer together.—To hill up any crop, take off the wood work to which the teeth are attached, and you have a most perfect implement for hilling. It is designed for corn, cotton, or any crop requiring to be hoed.

More information may be obtained by letter addressed to the assignee, Mr. Wright, care of A. Gordon, & Co., manufacturers of the implements, Rochester, N. Y.

Spark Arresters.

The patent of Gilbert Richards, granted this week, for an improved spark arrester, relates to placing within the usual inverted conical casing, at the top of the smoke pipe, a spiral flanch, the upper edge of which is in close contact with the inner side of the casing, and its lower edge inclining inwards towards the center, so as to form an acute angular recess around the casing.—There is also a suitable number of deflecting plates connected with this spiral flanch. The sparks are thrown by the deflecting plates into the angular recesses formed by the spiral flanch, and downwards while the smoke and heated gases pass upwards. This spiral flanch, while it arrests the sparks, has no tendency to choke the draft.

The Locomotive Works of Schenectady, N. Y., under the superintendence of Walter McQueen, turns out about one locomotive per week, and has been very successful.

Scientific American.

NEW YORK, MAY 19, 1855.

American Railroads.

The railroads of the United States embrace an amount of condensed labor, in the form of capital, which is truly astonishing. In 1828 there were three miles in operation; at the present moment there are twenty thousand. In that year there was only one railroad on our continent, now there are three hundred and thirty-nine. We have before us the recently printed and excellent Report of the New York State Engineer, John Clark, Esq., for last year, in which we find it stated that there are 2,723 miles of track in operation, with 803 miles of a double track, making a total of 3 526 miles in the State of New York. The whole length of railroads completed and projected is 4 436 miles. The amount of stock paid in is $69.473,458; and the funded debt $68.230,-997, making the total amount expended $137,704,455—a vast sum. There are 668 locomotives in use, and 8,816 passenger and freight cars. The passenger trains have run 7,024 190 miles on 2,437 miles of road, and the number of passengers carried amounted to about ten millions. Out of this number, one was killed for every 833,000 who traveled and one injured out of every 333,000. In 1853, one passenger was killed out of every 750,000, and one injured out of every 425,000. The safety to life in traveling last year, therefore, was greater than the year before. This is pleasing, and the more so, as it is recorded that not one passenger lost his life from causes beyond his own control, although the distance traveled by each amounted to 39½ miles. This is high testimony to the safety of New York railroads and their mode of management during the past year. It is certainly for their own interest to be very careful and employ none but competent persons, for we find that the New York and New Haven Railroad paid no less than $297,360 for damages to persons and property.

The greatest amount of destruction of life was that of persons run over while walking on the track, the number of such being no less than 66, and 35 injured. Our railroads, as we have advocated for years, should all be fenced in. Although last year was one of great depression in business, we find that the increase of passengers amounted to 50,000; thus showing that our people—come good or bad times—must be *about*, to "push, along keep moving."

The expenditures of these roads, last year, rather baffles us to understand. For maintenance of way the increase was 60 per cent., and for repairs of machinery 25 per cent.: thus showing that there has been a lack of economy somewhere. We commend the subject of contracting with engineers for running the engines, making repairs, &c. This has been found to work economically on English roads during the past year, and we cannot see why it may not on our roads.

The amount of wealth embraced in 20,000 miles of railroad, at $20,000 per mile for construction, would be $400,000,000; yet it it is a fact, that much of this is debt, and owned in Europe. Every effort should be made to liquidate it, for any public work, deep in debt, affords a sorry theme for congratulation, however grand and great the work may be. Thus we find, that the New York and Erie Railroad cost $33,439,431; $25,126,669 of which is debt.

The character of our railroads, so far as it relates to their management, suffered greatly last year by enormous frauds, perpetrated by some of those who had the principal management of them. At the present moment there are but a *very* few in our whole country which pay their expenses and interest on stock and debt.

Our country is well adapted for the building of railroads, at a small cost, in comparison with the English roads, and yet numerous sums have been thrown away for want of skill and knowledge in construction.

The greatest amount of expense is incurred in the building of bridges tunneling, deep cuts, and the filling of ravines.

Improvements will yet be made on machinery to reduce the cost of constructing railroads and also the running expenses. Indeed we are positive that the Suspended Purchase of W. H. Brown, noticed on page 156, this volume SCIENTIFIC AMERICAN, must greatly reduce the cost of many heavy works, such as the building of piers in coffer dams, &c. We have seen a model of this apparatus, weighing only five ounces, transport a weight of 75 pounds, with great rapidity, over a span of 81 feet, and made to deposit and take it up, at any point in the whole span. It is our opinion that it is one of the best engineering inventions of the age, and we have been informed that it is soon to be employed on the Troy and Greenfield Railroad, where the great tunnel is to be cut through the Green Mountains.

Our railroads must learn to save more in fuel, oil, and in construction. A great expense of fuel can be saved by substituting coal for wood-burning engines. On our railroads west of the Alleganies, especially, there is no good reason whatever why they should not use coke for fuel, as there is such an abundance of coal throughout the West.

Those connected with and deeply interested in our railroads should use great efforts to retrieve their character. A spirit of enterprise in searching out and adopting new improvements, and a rigid economy in every department, are required to place them upon a proper and paying level. We hope that the present year will be propitious in a bountiful fruitage and harvest, so that prosperity may again beam upon every department of labor and industrial interest, and by great increase of freight and passengers to our railroads, add to their income, and enable them to improve their shattered condition.

European Sub-Marine Telegraph.

If the British have displayed great inferiority in military management in the present war with Russia, it cannot be denied but that the national spirit for engineering enterprise has not failed to show itself in the most favorable light. Thus in the Crimea Uncle John has carried his railroads with him, and the locomotive is used there to wheel up shot, shell, and other implements of war. To think of a railroad being built in a few weeks, by John Bull, in the possessions of the great Emperor of Russia, as an auxiliary of a modern campaign, is something so strange and different from war, as heretofore practiced, that we cannot but give great credit to the spirit that planned and executed the work.

In connection with this, the last news from Europe brought the intelligence that an electric telegraph line had been completed from Balaklava to London, and that Lord Raglan sent to and received messages daily from England. From the camp in the Crimea, to the War Office in London, the Commander in Chief now reports direct the state of the seige every few minutes. Two weeks ago, such information could not be conveyed in as many days as it now takes seconds; and last year not in as many weeks. A telegraph submarine cable, 301 miles long, is laid in the bed of the Black Sea, stretching from the monastery of St. George, in the Crimea, to Kalerga, on the Bulgarian shore, from which communication is had by land lines, and other submarine lines, to England. This is an important triumph of modern engineering enterprise and skill which deserves our admiration. English telegraph engineers deserve great credit for the boldness and enterprise they have exhibited in laying down so many ocean lines. They have made the ocean a highway of thought; their government speaks to its soldiers thousands of miles away, through the waves of St. George's Channel, those of the Mediterranean, and the Black Sea. In a few years more, unless our telegraph engineers move a little faster than they have done, we are afraid that John Bull will take some of the starch out of their collars, by building an ocean telegraph which will unite our country with Europe. Mr. Shaffner, when he was in Europe, it was reported, obtained grants from the Emperor of Russia and the Kings of Denmark and Sweden, to run telegraph lines through their dominions, as part of an ocean line between Europe and our continent, all of which grants, we apprehend, will be of no use whatever, unless something be done quickly to make use of them; for assuredly Uncle John has the advantage of route from Ireland to Newfoundland, and we rather think he will not neglect it. We are a people famous for acting while others are talking. Look out, American telegraphic engineers, that John Bull does not steal away our good name by the construction of the first Atlantic ocean telegraph line.

The Copper Regions—A Great Work Accomplished.

The St. Mary's ship canal at the Saute, connecting lakes Huron and Superior by navigable waters, was ready to pass vessels on the 18th of last month. This work was commenced in June 1853.

The completion of the Saute St. Marie Ship Canal must ever be a marked period in the history and progress of the Lake Superior mines. It is only six or seven years ago since mining operations were commenced with any degree of system on the Michigan shores. Notwithstanding the many reverses which are inseparable from mining enterprises, and which are increased tenfold when the operations are conducted in the midst of a dense forest, in some cases many miles back from the lake, without a road, and hardly an Indian trail to guide the adventurers from the shore to their retirement, with no means of transport but the backs of the packers, and at certain seasons these trails, marked only by blazes on the trees, and rendered impassable by melting snows or heavy rains; all these hardships which introduce civilization into a new country, the pioneers of Lake Superior have had to contend with, but their trials and perseverance have not been unrewarded; already there are about 15,000 settlers in the region, and their numbers must annually increase with the improvement of the country and the developement of its vast mineral resources.

Amongst the first advantages experienced by the opening of the ship canal at the Saute St. Marie, will be the great reduction in freight on goods, provisions, and machinery, from Detroit and the lower lakes, which have been exorbitantly high. Among the mines most successful in the Lake Superior regions are the Cliff, Minnesota North American Copper Falls, National, Norwich, Ohio Trap Rock, Toltee, Douglas, Houghton, Forest, &c. The Minnesota shipped during last season of navigation 771 tuns, being almost entirely masses of pure native copper, worth over £60,000; the produce for the month of December was 77 tuns. Pure copper is found there in huge masses, which are cut into pieces of such weight and dimensions as will allow them to be raised to the surface through the shafts; pure silver occurs, as it were, growing, sometimes in beautiful crystals, upon these masses of copper.

Ontonagon must be the leading town on the lake, situated at the mouth of a tolerable river of the same name, with a natural harbor, which might be greatly improved by a new pier and breakwater. A plank road has been contracted for, and already six miles of it laid from the town towards the mines, which, when completed, will effect a great saving in the carriage of stores, machinery, and mineral produce. A fine hotel has been erected, with seventy rooms, in this village; the lake teems with the finest fish, and the air is most healthful and invigorating—this is a great country.

India Rubber—Tough as Ever.

Two patent cases were decided in the Circuit Court, U. S., this city—Judge Nelson presiding—on the 8th inst. They related to that elastic material india rubber. The one was C. Goodyear against Brown and Bourn, in equity, for infringing the vulcanizing india rubber patent of Goodyear. A permanent injunction was prayed for, and a preliminary one had been granted. The preliminary injunction was dissolved, and the motion for a permanent injunction denied, because it appeared, that previous to the commencement of the suit, other parties had purchased Goodyear's exclusive right to manufacture india rubber shoes. A motion to amend the plaintiff's bill, so as to include these new parties, was denied. Judge Nelson said, that the amendments could not be allowed as it would, in effect, be the institution of a new suit against the defendants, materially different from the present one, both as complainants and right of action.—This exceeds the province of amendment as was held by the United States Supreme Court.

Patentees will take notice of this important legal point.

The other case was that of Chas. Goodyear and the Ford India Rubber Manufacturing Co., against Edwin M. Chaffee, and Brown and Bourn, of Providence, R. I., for infringement of the Goodyear vulcanizing india rubber patent. The motion was for an injunction to restrain the defendants from the manufacture of india rubber goods, which they prosecute in Providence. It was denied, because the defendants resided in another jurisdiction, and carried on their business there, consequently they were beyond the process of an injunction, and the issuing of it would be inoperative and useless. "If plaintiffs," said the Justice, "desire to enjoin the defendants, they must file their bill in the jurisdiction where the business is carried on."

Some lawyers lead their clients into the most unreasonable and expensive courses of action. They should know their business better.

Another McCormick Reaper Case.

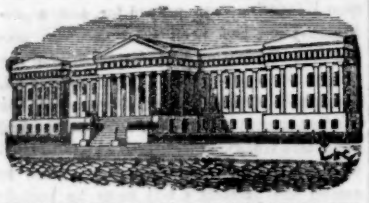
On the 8th inst., Judge McKean, in Cincinnati, refused to grant an increase of security to McCormick, against Mowry & Co, the latter being sued for an infringement of McCormick's patent.

American Plate Glass.

On Thursday last week, we experienced the pleasure of seeing the first plate glass manufactory, established in our country, in successful operation, at the foot of North-sixth Street, Brooklyn (formerly Williamsburg). In the month of January last, not a brick of it was laid; and on the day mentioned we saw six huge plates of glass, nine feet by four, cast with great expedition, and with as complete success as if it were in an old establishment. Some speeches were made after witnessing the operations, by some of the select party invited; of these some were very appropriate and pointed, others were not. Judge Beebe, who was present, paid Mr. Dickson, the manager, a very high compliment; he said he came here from England, with all the plans in his brain, and had ordered everything from beginning to end, and so well had everything been planned and executed, that not a single brick had to be relaid, and nothing has been wrong done.

The process of making plate glass consists in melting the silex and flux in large crucibles, then emptying the molten mass upon a smooth iron bed, with guide ways or strips of metal at the sides, on which rolls a huge iron roller, which smooths down the molten mass on its bed, like a baker rolling out a cake. When it congeals, which it does rapidly, it is shoved on a rolling table into the annealing oven. American white sand, for making glass, took the prize in the London Exhibition in 1851, and we see no reason why we should not manufacture as good, if not better plate glass than any other nation. The six large plates were made in about an hour; everything was conducted skillfully and no mistakes were made; the utmost satisfaction was given. The best wishes were expressed for the success of the enterprising American Plate Glass Company.

E. B. Dobson, of Reading, Pa., has manufactured gunpowder with anthracite, as a substitute for willow charcoal.



[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office,

FOR THE WEEK ENDING MAY 8, 1855.

TAPE FUZE—Philip Bacon, of Simsbury, Conn. : I claim the application, substantially as described, to tape fuze of an external winding of thread, whereby the loosening or cracking off of the tape and water proofing substance is effectually prevented, and the manufacture of the fuse cheapened and simplified, as set forth.

[A brief description of this improvement in "fuze" may be found on another page.]

SEED PLANTERS—G. W. Brown, of Galesburg, Ill. : I claim, in combination with the hoppers, and their semi-rotating plates, d, the runners, A, with their valves, f, and their adjustment by means of the levers and cams, and the drivers weight, for the purpose of carrying and dropping seeds by each vibration of the lever, D, and to regulate the depth of the planting, as described.

PREPARING TURPENTINE FOR DISTILLATION—Alex. C. Blount, of Mount Pleasant, Ala. : I claim freeing the crude turpentine of chips, bark, straw, and other impurities and coloring matter before introducing it to the still, by melting it in a cylinder or vessel, A, which contains one or more selves, a1 a2, and is arranged in such manner that the melted turpentine may run from it to the still by gravitation, substantially as described.

[This apparatus for preparing turpentine for distillation is said to be a valuable invention. A description of it may be found on another page.]

STONE AND MARBLE SAWS—John T Bruen, of New York City : I do not claim the using of sand and water, or other grit, with a plain metal plate, as new ; nor the blade with grooves cut in it.

But I claim the making of the body of the saw plate of woven wire or strips of metal, or any analogous device, for the purpose of admitting the free passage of the grit, in the operation of sawing stone, substantially and for the purpose as described.

I also claim, in combination with the above, the waved cutting edge or any analogous device, substantially as and for the purpose described.

I also claim forming the edges of the saw blade thicker than the central portion so as to admit the free passage of the grit on both sides, through the indentations as set forth.

LAMPS FOR BURNING FLUID—Dexter H. Chamberlain, of West Roxbury, Mass. : I claim the employment of granulated pumice stone as a packing for spirit lamps and other vessels containing any inflammable hydro-carbon, in the manner and for the purpose substantially as set forth.

MACHINES FOR MAKING BOLTS—Robert Crichton, of Buchanan, Pa. : I do not claim the adjustable shaft, L, the detached shaft, K, the spring, g, or the stop h, these having been known and used separately before; but I claim the combination of the adjustable shaft, L, the detached shaft, K, the spring, g, and stop, h, with the sash, M, and horizontal heading tool, J, to regulate the quantity of iron in and thickness of head, as shown and described.

BOOT CRIMPS—Thomas Dougherty, of Erie, Pa. : First, I claim, substantially as described and shown, the projections, E and F, to which the leather may be tacked, after it is stretched, thereby permitting the stretching apparatus to be removed and applied to another crimping board.

Second, the nut, I, as constructed with projections fitting upon both sides of the elbow, applied and operating substantially as described.

FAUCET—William Fowler, of New York City : I claim the construction of the faucet, as shown and described, viz., having the lower end of the tube, E, fitted within a valve seat, D, which seat is screwed into the upper part of a socket, C, at the upper part of the main pipe or tube, B, and adjusting the lower end of the tube, E, snugly within the valve seat, D, by means of the nut, F, the tube, E, turning within the seat, D, the seat, D, and tube, E, being provided with openings, c d, which, when made to coincide with each other by turning the nozzle, G, and tube, E, allow the water to pass up through the nozzle.

[To purposes this invention is recommended. See a notice of it on another page.]

RAILROAD CAR VENTILATORS—D. H. Fox and John Fink, of Reading, Pa. : We are aware that air has been passed through water and injected into railroad cars, such therefore we do not claim ; neither do we claim the mere employment of suction to produce a current.

We claim the construction in or on the top of the car of a long shallow chamber, a, communicating at several points with the interior of the car, and by a tube with a fan chamber beneath the car, whereby the partial exhaust created in said chamber by the running of the car, produces a number of upward currents simultaneously in various parts of the car, sufficient to carry off the vitiated air and dust from the same, as set forth.

APPARATUS FOR DISSOLVING SILICA—Benj Hardinge, of New York City : I do not claim, in the present application to have discovered any new solvent principle for silex, either by the alkaline salts named, or steam under high pressure, as these facts have long since been known to chemists, I do not claim the heating the steam in coiled pipe, and thereby forcing it to the bottom of the boiler, A.

I do not claim any originality of structure of the furnace or the manner of setting the boiler with its man-hole or gauge cocks.

I do not claim the structure of the cold water tank itself ; but I claim the filling the pipe, C, with the water from the upper stratum in boiler, A, so constructed as to find its common level in pipe, C, in furnace, D, from whence the heated steam is forced over and down into the under stratum of the heavy silicates by the horn pipe, E, while the steam pressure is relieved from the surface by my relief pipe 17, which coils through the tank, fig. 2, of cold water, for the purposes described and set forth.

FACING BEDS FOR GRINDING ARTIFICIAL GRANITE, &c.—Benjamin Hardinge, of New York City : I claim the described artificial grindstone or facing bed, consisting of a saucer-shaped dish filled with a concrete of the materials specified, or others substantially the same.

Also, the suspension of the shaft which carries the rotary facing bed, upon steel supporters, substantially as, and for the purpose set forth and described.

SAWING OR FELLING TREES—Simon Ingersoll, of Greenwich, Conn. : I claim the manner herein described of giving to the segmental saw its reciprocating action during the forward feed of the same by means of the pitman, H, connected by link rod, K, to the saw frame, and by joint or link rods, J, to the side, carrying the saw or saw frame, and giving forward feed thereto, substantially as, and for the purposes set forth.

MODE OF CHECKING WIND MILL—A Lempeke, of Pleasant Mount, Pa. : I claim operating the sleeve or collar, D', or moving said sleeve or collar on the shaft, C, towards the wings or sails, d, by means of the screw, M, on the shaft, C, rod, L, attached to the sleeve or collar, D', and lever, J, as shown, whereby the chains, e, are slackened, and the wings or sails allowed to turn edgewise to the wind, and consequently stopping the mill, as described.

[A brief description of this improvement in wind mills may be found on another page.]

PROPELLER—Henry Link, of Little Falls, N. Y. : I claim a semicircular propeller, constructed and operated substantially as described, for the purposes set forth, whether the same is used with or without hinged paddles.

GRAIN HARVESTERS—T. N. Lupton, of Winchester, Va. : I do not claim the endless apron, S, nor the inclined apron, S as they have been previously used ; nor do I claim the device for giving motion to the working parts, as that is common to the generality of harvesters.

But I claim the employment or use of the cutters, d, placed on the rotating shaft, M, in combination with the two sets of fingers, P Q, the parts being constructed, arranged and operating in the manner and for the purpose as shown and described.

[The nature of this invention is briefly described on another page.]

GRAIN AND GRASS HARVESTERS—John H. Manny, of Rockford, Ill. : I claim the combination of a removable auxiliary divider, with a fixed divider, substantially as set forth.

GUIDES FOR HEMMING AND CORDING—H B. Odiorne, of Philadelphia, Pa. : I do not claim an adjustable spring guide for a sewing machine ; nor do I claim the combination of a guide for the cord with a hemming guide, as in the patent of S. C. Blodget, upon which invention I conceive I have made a marked improvement.

But I claim the curved retainer, G, with its notched end, h, in combination with the shoe, d, for effectually keeping the cord in contact with the inside of the hem of the fabric, while the said hem is being operated upon by the needle and thread of a sewing machine.

VENTILATING RAILROAD CARS—William Pauli, of Alexandria, Va. : I claim the arrangement of guard sash, F F, on the sides of the cars, in connection with descending tubes, D D, and hood, C, upon the top thereof, by which the dust is prevented from entering a window when opened, while the exit of the air and ventilation of the car is not effected by said guard sash, substantially in the manner described.

WINDOW SASHES—L. E. Payne, of Yazoo City, Miss. : I claim arranging or adjusting the sashes within the frame or casing, as shown and described, viz., having strips, d d', attached to the inner sides of the frame or casing, the outer edges of the strips being inclined or beveled, and shown, and fitted within rebates, c c', in the inner surfaces of the stiles, a, of the sashes, the shoulders of said rebates being inclined or beveled, so as to correspond inversely with the edges of the strips, d d', for the purpose set forth.

[See notice of this improvement on another page.]

SPARK ARRESTER—Gilbert Richards, of Cummington, Mass. : I claim the spiral flanch, B, and deflecting plates, D, arranged as shown and for the purpose set forth.

[Improvements calculated to increase the comfort of railroad travelers, interest almost every person. See a brief allusion to this invention on another page.]

BALANCE GATE FAUCET—Ezra Ripley, of Troy, N. Y. : I claim the combination of the duplicate discharge gates of the faucet tube, constructed, as described, with the duplicate discharge cut-off gates. The two parts being combined in the manner, as shown, for the purpose of forming a balance discharge and cut-off gate, for faucets or fluid gates.

NOZZLE FOR HOSE PIPES—A. W. Roberts, of Hartford, Conn. : I claim the combination of two or more movable nozzles or tips, of different sizes, attached to one pipe, which can be moved by the pipe holder or his assistant, to change the size of the stream when in motion, for fire engines or other purposes.

LEATHERING TACKS—M. M. Rhodes & J. C. Rhodes, of Taunton, Mass. : We claim, first, the employment substantially as described, of a hollow cylinder with an opening in the side to receive the tacks, and a driver working within it in a suitable manner to expel the tacks at the end of the cylinder, and drive them into the leather, or any material serving the same purpose, which is presented in a suitable manner to receive them.

Second, operating the cylinder and driver, substantially as described, so that the former may receive a short, and the latter a long movement, and that the final operation of the form r to cut the leather or other material on the punch may not take place till after the termination of the operation of the latter in driving the tack through the said leather or material, as fully set forth, but may be produced by a continued movement of the latter, after it has driven the tack through.

Third, we claim the divider, consisting of one or more tongues similar to I I', having a straight edge working nearly close to and across the entrance of the receptacle into which the tacks are fed, to be submitted to the operation of the driver, and having a beveled end terminating in a point to separate the tacks one by one, as they are brought by the feeder contiguous to the aforesaid receptacle, and to conduct and push them as required into the said receptacle, substantially as described.

Fourth, we claim forming the mouth, o, of the barrel, with a projecting lip, k, substantially as described, for the purpose of passing outside the point of the tack, as the barrel rises, and the tack is entering the mouth, and thereby preventing the point from going down the outside of the barrel, and letting the tack fall headforemost into the barrel.

[This is a valuable invention, and we have a description of it written out, but find, on re-perusing it, that the operation of the mechanism cannot be well understood without engravings, we therefore omit its publication for the present.]

SASH SUPPORTERS—Chas. R. Rode, of New York City : I claim the construction of the fastening, as shown and described, viz., having a longitudinal shaft or rod, C, inserted in the lower cross piece of the sash, B ; a pawl, a, being attached to each end of the shaft or rod, said pawls catching into racks, b, attached to the back sides of the grooves in which the sash is fitted, the shaft or rod being provided with a thumb-piece, D, which projects through a mortise or slot, c, in the cross piece of the sash and directly over a plate, E, attached to said cross-piece, shown and described.

[This is one of the simplest and best sash supporters on which a patent has issued for a long time. A description of it may be found on another page.]

PROCESSES FOR PREPARING LIQUIDS FOR AIDING DIGESTION—J. J. Sherman, of Albany, N. Y. : I do not claim the solution used, that being substantially as described by Liebig nor any part of the manufacture of malt liquors.

But I claim the new composition produced substantially as set forth.

[This is certainly very intelligible.]

APPARATUS FOR REGULATING SUPPLY OF WATER TO STEAM BOILERS—T. J. Sloan, of New York City : I claim the employment of the feed water before it enters the boiler as a motor for giving the alarm when the water is too low in a steam boiler or generator, substantially as described, in combination with the float inside the boiler for indicating the level of water, and setting the mechanism that the alarm may be operated by the mechanism receiving motion from the feed water, substantially as specified.

And I also claim stopping the supply of water to the boiler by the employment of a stop to check the working of the valve, substantially as specified, but this is the only claim when the said stop is simply set by the float within the boiler, as set forth.

FIRE ARMS—John Stowell, of Charlestown, Mass. : I disclaim the invention of the combination of the hammer with the sliding crotch, for the purpose of effecting the cocking of the lock, simultaneously with and by the same movement as the rotation of the breech, in any other way than substantially as described.

But I claim the method described of effecting the connection between the hammer and the lever, D, by which the sliding crotch is operated by means of a lever, d, and two stirrups, e and f, applied and operating substantially as described.

[This is a valuable improvement in fire arms, but as patents are being taken in Europe, it precludes our describing it at present.]

ROLLING RAILROAD RAILS—A. J. Suffern, of Suffern, N. Y. : I claim the employment of three rollers in combination, arranged with their axes in the lines of an equilateral triangle, each roller having a projecting fillet, and a groove each side, and the three working in unison, substantially as specified, for rolling the tread rails, each roller forming the surface from the middle of one tread to the middle of the next, and the groove between, of such form that each head or tread may be wider than the thickness of the shank, as set forth.

PLOWS—E. C. Travenner and Oscar Nesmith, of Hamilton, Va. : We do not claim the lip piece, b b, toe piece, S, or grooved rest piece, c ; but we claim the land side plate, a a a, in combination with the fend-off or cleaner, K K, constructed and arranged substantially in the manner and for the purpose set forth.

SMUT MACHINES—G. B. Turner, of Cuyahoga Falls, Ohio: I claim, first, in combination with the scouring disk or runner, and outside concentrator, the inner perforated and partial concentrator, slightly elevated from the outer one, for the purpose and in the manner set forth.

I also claim, in combination with the screen, H, in the blast trunk, T, the opening, n, directly under said screen, to allow the white caps which may have passed through the scouring plate to pass out, instead of being held up against the bottom of said screen by the blast, as set forth.

SILVERING LOOKING-GLASSES—Joel Webster, of Brooklyn, N. Y. : I claim, first, the two tables, A A, having elastic faces, and being employed in combination with each other, substantially as and for the purpose described.

Second, when the requisite elasticity is given to the faces of the tablets, A A, by the employment of an air packing, I claim connecting the air cavities, a a, by means of a flexible tube, d, as described, by which means both cavities are caused to be filled with air at once, and to contain an uniform pressure.

[This is an invention in a new field for this country. See a description of the apparatus on another page.]

INKSTAND—Henry Whitney, Jr., of Cambridge, Mass. : I claim the well, k, and the cylinders, b b b, in combination with the piston, c, and the cylinders, d d d, for the purpose of raising and sustaining the ink above its level in the inkstand, without the necessity of using the tight-packed joint heretofore required.

SHINGLE MACHINE—A P. Wilson, of Piqua, Ohio : I claim the mode of adjusting the block out of which the shingles are to be cut, as set forth, by means of the adjusting slats, q q q q, underneath the doors, t t, and also the springs for supporting the shingle, as set forth, also the cleaners, g g, for the purpose of cleaning the shingle from between the knife and springs and for the purpose of keeping the doors, t t, clean from all substances that may fall on them.

METHOD OF SAWING A LOG BY ITS OWN WEIGHT—F. A. Wolff, of Ripley, Miss. : I do not claim the principle of sawing timber by machinery driven by the weight of the log itself.

But I claim the method described of making the weight of a log or logs of timber propel the saws which saw them, by suspending them on endless chains, working around chain wheels, which drive the saws substantially as set forth.

GAS REGULATORS—G. B. Woodruff and J. N. Palmer, of New Haven, Conn. : First, we claim the employment of adjustable escape tubes or passages, b b, at the upper part of the air chamber, in connection with valves attached to a float, I, which rises and falls with the water in the air chamber, the said valves acting substantially as described, to close the said tubes or passages to confine the air in the air chamber when the water or other liquid reaches a certain level therein, and thus prevent the water being in the gas chamber, pressed down below the regulating float.

Second, we claim the employment of two induction valves, F G, arranged and connected by a spring, h, in such a manner that when the pressure of gas in the gas chamber increases to such a degree that the action of the float would close both of the said valves, and entirely shut off the gas, the said spring will yield to the pressure of the gas upon the under side or front of one of the valves, and allow that valve to remain open until the pressure in the gas chamber is reduced, and the level of the liquid therein is restored sufficiently to open the other valve, substantially as set forth.

[For a description of this gas regulator see another page.

PLATING AND TWISTING CORD.—Wm. H. Zahn, (assignor to F. Remer,) of New York City : I claim the described arrangement for driving the flyers consisting of the circular rack, f, gearing with the spur wheels, y y, said rack being on a table, B, which has a central pivot, through which the spindle of the flyer frame passes, whereby the flyers are set in operation, whether the flyer frame or the table revolves, and are enabled to receive merely a rotary movement on their own axes for making twist, or such rotary movement combined with a revolution round a common axis for making cord, as set forth.

[This important improvement in plating and twisting cord is described briefly on another page.]

APPARATUS FOR MANUFACTURING STARCH—H. V. Duryea, of Oswego, N. Y., (assignor to the Oswego River Starch Co.) : I claim the construction and adaptation of the rake, 2, furnished with teeth, 7, and hung on chains, 6, for digging, cutting up, and loosening starch deposits.

ARTIFICIAL FUEL—Thomas Hooker and W. D. Beaumont, (assignors to A. A. Pray, N. M. Harris, E. C. Lemoyne, J. R. Jennings, G. G. Kirk, and L. A. Kirk,) of New Orleans, La. : We claim the manufacture of a new article of fuel, composed of lime, fine coal, clinkers, rosin, carbonate of ammonia, and bagasse, or their equivalents, mixed in the proportions substantially as set forth.

SAWING WEDGES OR SHINGLES—John Taggart (assignor to himself and Nehemiah Hunt,) of Boston, Mass. ; I claim the peculiar combination of mechanism employed for moving the bolt forward, and changing its position, so that a shingle or wedge shall be removed from it by the saw during each longitudinal movement of the bolt produced by the main carriage, the said combination consisting of the carriage, E, the turning bearer, F, its lifting catches, G H, the notched racks, D D', the two levers, I K, the stationary lifters, L M, and the stationary rails, N O, the whole being combined with the main reciprocating carriage and the frame of the machine, and made to operate together, and with the circular saw, as specified.

ADDITIONAL IMPROVEMENT.

MODE OF REGULATING THE FURNACE OF HOT WATER APPARATUS—Originally dated Dec. 5, 1854. T. T. Tasker, of Philadelphia, Pa. : I claim as an improvement of the regulator for hot water apparatus for which letters patent were granted to me on the 5th Dec., 1854, the arrangement of the three dampers or valves, P O M, and their several connecting rods, in combination with a single float placed in the open tank above, as set forth.

DESIGNS.

COOKING STOVES—Benj. Wardwell, E. R. Barstow & G. C. Hawkins, of Providence, R. I.

The following were omitted May 1st, by mistake :

CLOCK FRONTS—W. B. Lorton, of New York City.

COOKING STOVES—George Warren, S. H. Sweetland & E. C. Little, of Crescent, N. Y.

WATER COOLERS—Garretson Smith, Henry Brown, and J. A. Read, of Philadelphia, Pa.

[NOTE.—During the week ending, as above, forty-four new patents were granted, among which are several very important as well as some very singular inventions. Taken altogether they form a curious medley of novelties—a sort of Kaleidoscope—exhibiting Tape Fuzes for blasting; Seed Planters, Distillation of Turpentine, Saws for Stone and Marble, Lamps for burning fluid, Machines for making iron bolts, Boot Crimps, Faucets, Car Ventilators, Apparatus for dissolving Silica, Facing Beds for artificial granite, Machines for cutting down trees, Windmills, Propellers, Harvesters, Sewing Machines, Window Sashes, Spark Arresters, Hose Pipes, Machines for leathering tacks, Sash Fastenings, Composition for aiding digestion, Steam Boiler Feeders, Fire Arms, Machine for making iron rails, Plows, Smut Machines, Apparatus for silvering looking-glasses, Inkstands, Shingle Machines, Mode of sawing a log by its own weight, Gas Regulator, Cord Twisters, Starch Apparatus, Artificial Fuel, Cooking Stoves, Clock Fronts, Water Coolers, &c.—One-third of the entire number were obtained through the Scientific American Patent Agency. The Patent List this week is of average length.

(For the Scientific American.)

Mr. Paine himself before the Public.

I notice an article in your last issue under the head of "H. M. Paine again before the public," which asks for certain explanations of the *Worcester Palladium*. Under all circumstances I deem it best to answer for the *Palladium* myself. For some six years past my name has been continually kept before the public as synonymous with that of humbug. Now it has, in one sense, been in my power to remove any such impressions from the minds of the community. But as there is a time for all things, I have not done so till the date mentioned by the *Palladium*. I have never at any time announced a discovery or invention that I have failed to bring out, and with the exception of the "water light," all are now in successful operation. As regards the *Water Light*, or my apparatus for resolving water into a gaseous state, it is admitted that I failed, up to last June, to make it of practical use, but that I made it accomplish all the results I claimed, is established by authority beyond all cavil. The names of Dr. Channing, Prof. Doremus, Prof. Wright, Lasell, and others, are sufficient guarantee of the existence of a fact, and to these I might add your own names had you seen fit to accept my invitation to examine the apparatus.

I have not for one moment abandoned my faith in the ultimate success of the discovery, but have continually labored for its perfection. This spring finds me in a position that warrants the hope of a confirmed success, and I have accordingly given three lectures in our City Hall on the "Vicissitudes of an Inventor's Life, as Illustrated by my own experience." Had you been present you would have known that I did "mention names" and facts, and you would have been made aware of more than "a single case wherein Mr. Paine has suffered injustice from the hands of the public." You certainly cannot have forgotten the outrage of the "Scientific Committee," nor its rebuke by President Youngs. Why, I have more than one public journal by me now, wherein I find it announced that H. M. Paine has committed suicide,—the exposure of the Scientific Committee being more than he could bear.

In conclusion I would say, that no where in the Union have I been abused more than here in my own city; and here in my own city have I commenced to disabuse myself and the public mind. As to my success, I refer you to our press. I shall continue to lecture and make my demonstrations through the different cities of the United States, leaving the public to sit in judgment on the "Scientific Committee" and its abettors.

HENRY M. PAINE.

Worcester, Mass., May 7th, 1855.

[Mr. Paine suppresses the main points, which we disputed to be erroneous in his water light, namely, that he had not resolved and could resolve water into one elementary substance—hydrogen, and that, at almost no cost, by mechanical action. He has no business to conclude that he could have added our names to those of Professors Doremus, Wright, Lassel, and Channing. He has failed to produce the least proof of his asserted discovery, of water being a simple substance, his catalyzing of gas, &c. Our *experience* in such matters, we do not place on a level with the gentlemen whose names he has quoted ; not that we profess to be any sharper than they. We did not accept Mr. Paine's invitation to visit his apparatus, from the fact that we did not think there was any necessity for us to do so. We said, if he had made the discovery to which he pretended, we did not want to see and examine his set of apparatus, but we wished a minute description of it, so that we could try for ourselves whether his alleged discovery was true or not. This he did not furnish ; but the invention, which was asserted to have been sold to Mr. Archibald, for a valuable consideration, when patented in England, we published, with illustrations, on page 249, vol. 6, SCIENTIFIC AMERICAN, and that fully developed its ridiculous pretensions.

Reading Matter by the Mile.

The proprietor of the New York Weekly *Sun*, in a novel advertisement announcing the cheapness of that journal to country subscribers, states that each number contains 6,150 lines of print, which, placed in a continuous string one after the other, would reach a quarter of a mile. In a year, therefore, the subscriber receives twelve miles of reading at a cost of 60 cents, or 5 cents a mile the club rates; or 75 cents single subscriptions. Perhaps this is the beginning of a new era in the sale of literary products. Who knows but the public will yet come to inquire of the publishers, "How much a mile do you charge for your work?" instead of "How much a year or volume."

TO CORRESPONDENTS.

W. M., of R., of Ohio—At least a dozen persons have proposed to us to employ a float connected with a throttle valve, as a marine governor, said float to rest upon the water near the wheel, so that when the wheel rose from or was left by the water, the float remaining on the surface would close the throttle, and when the wheel was in the water the float, would rise and open wide the throttle, always giving a supply of steam proportioned to the depth of dip of the wheel ; we state for the benefit of our numerous readers that a patent was refused for this device a year or two ago, on the ground that something had been proposed many years before.

G. M., Jr., of Ill.—Your plan for heating water for locomotives is good, but the idea of employing the escape heat of the chimney for that purpore, is not new. On page 140 of our present volume (Jan 13, 1855) you will find engravings of Wilder's patent, which accomplishes what you propose in a very successful manner. Your combination of parts, however, is different, and perhaps can be patented. If you would like to try, send on a model and government fee of $10.

J. B. C., of Tenn.—Ellipsographs, substantially like that you represent, can, or could a year or two ago, be purchased in this city. There is no essential point of difference between them and yours.

G. W. F., of D. C.—We do not know of any work that will give you the information desired on plumbing, tinning, and lacquering pendants.

R. McC., of Pa.—It is by boiling in soap, or in an alkaline solution, that colors for washing are tested ; prussian blue does not withstand a warm strong alkali.

S. W. L , of Ohio—There is no paper published called the *Mechanics Guide*, for the instruction of carpenters that we ever heard of.

N. H. A., of N. Y.—We have not heard of the decision to which you refer. It is exceedingly difficult to get accounts of cases from the different U. S. Courts.

S. C. B., of Ga.—Howd's patent for water wheel expired in 1852 ; you are therefore at liberty to use it. $2 received. Our paper will be forwarded.

R. S., of M. D.—Your communication is too long for publication. You might have put all your ideas into one fourth the space, and they would have read better.

G. G., of New York City—Carburetted hydrogen gas is the name of the kind used for illuminating our city. It is produced by destructive distillation of bituminous coal.

A. H., of Vt.—Those who say that the term "without form," in Genesis, describing the primitive condition of the earth, means gas, that being, as they argue, the only condition of matter which might properly be so named, forget that the term is just as applicable to liquids as gases. A dew drop is not a perfect spheroid ; its base is a plane. We have no doubt but the molecules of gas are spherical.

B. T. B., of ——,—Ventilating cars by causing the air to pass through a porous substance moistened by water, is good, and would work well, but it is not new, having been before patented.

Jeptha A. Wagner—Can any one give us the address of this gentleman, inventor of the Clover Harvester.

G. P. K.—Your mill stone dress we do not regard as patentable.

Carpenter's Patent Rotary Pump—In reply to correspondents who inquire concerning this invention, we would state that Chas. H. Hussey, of Boston, Mass., is manufacturer of them for New England and the East, to whom letters may be directed, care of H. Loring.

E. J. L., of Mass.—For artificial birds' eyes, address J. L. Bode, 16 North William street, N. Y.

T. & E., of Mass.—You could not obtain a patent for making the cylinders of planing machines of wrought iron. The owners of Woodworth's patent could not trouble you for substituting wrought in place of cast-iron cylinders, for those who desire the alteration made on their machines. Woodworth's patent expires in Dec., 1856.

C. M., of Pa.—The mere alteration of the dimensions of a machine does not constitute an invention. For this reason your harvester is not patentable.

G. S., of Mass —We believe the boring machine you refer to is not patented.

J. R. A., of N. Y.—Your letters patent are received, and in the hands of the engraver, who will have the cuts done in about two weeks. The cost of the engravings you will oblige us by remitting ($15)

Thos. S. Whitenack, Esq., Bound Brook, N. Y.—Yours of the 8th is at hand. Contents noted, and will receive due attention. We will advise you as you request.

J. C. S., of Ohio—We do not remember any patent on a door bolt moved on the screw propeller fashion, and we are inclined to think there is a chance for you to immortalize yourself. Send on your daguerreotype, with model and government fee, and we will try to place your picture in a conspicuous position in that "Inventor's Gallery." We think of agitating the propriety of having the patent law so amended as to require all inventors to furnish their portraits with their models, or of having them attached to the latter. In this way only can justice be done said factorily to all concerned.

W. E. C., of Pa.—There is always some doubt as to the obtaining of the patent in every application. We will do our best to get you a patent, but may fail.

Money received at the SCIENTIFIC AMERICAN Office on account of Patent Office business for the week ending Saturday, May 12 :—

B. & D., of N. Y., $30 ; P. & B., of O., $30 ; C & E., of O., $35 ; J. P. H., of O., $25 ; G. W. M., of Wis., $30 ; I. M. W., of Mich., $10 ; W. M., of Pa., $30 ; J. S., of Pa., $35 ; A. W. W., of Miss., $20 ; W. D. P., of N. Y., $30 ; H. M., of N Y., $200 ; G. L. S., of Mass., $30 ; H. S., of N. Y., $35 ; J. & H., of N. H., $30 ; W. T., of Tenn., $25 ; D. N. D., of Mass., $30 ; E. A., of Ill., $27 ; J. U. W., of N. Y., $30 ; A. K., of Md., $30 ; P. G. G., of N. Y., $5 ; A. L., of Pa., $25 ; M. B. H., of Miss., $25 ; H. C., of Ill., $15 ; E. B., of Ind., $30 ; M. B., of N. H., $30 ; J. H. P. C., of Ct., $30 ; J. E. R., of L. I., $25 ; O. B. S., of N. Y., $20., S. M. B., of Mass., $30 ; L. B., of Ct., $27 ; H. W., of Wis., $40 ; S. B., of O., $30 ; J. J. B., of Ind., $30 ; W. L. C., of Pa., $30 : J. S., of Pa., $25 ; W. F. F., of Mass., $30 ; J. W. M., of N. H., $25 ; J. B L., of N. Y., $25 ; W. S. F., of N. Y., $25 ; H W., of N. J., $25 ; V. P. C., of N. Y., $55 ; S. H. T. T., of Md., $40 ; S. D., of Me., $10 ; J. B. D., of Mass , $10.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, May 12 :—

M. B. H., of Miss. ; A. L., of Pa. ; J. & H., of N. H. ; H. C., of Ill. ; S. & P., of O. ; E. B., of Ind. ; J. B. L., of N. Y. ; W. T., of Tenn. ; H. W., of N. Y. ; W. S. F., of N. Y. ; E. A., of Ill. ; H. W., of N. J. ; J. E. R., of N Y. ; H. W., of Wis. ; J. S , of Pa. ; G. D , of Ct. ; V. P. C., of N. Y. ; J. W. M., of N. H.

UNITED STATES PATENT OFFICE,
Washington, April 23, 1855.

ON THE PETITION of Hiram Dilaway, of Sandwich, Mass., praying for the extension of a patent granted to him on the 21st Aug., 1841, for an improvement in the construction of molds for pressing glass, for seven years from the expiration of said patent, which takes place on the 21st day of August, 1855—

It is ordered that the said petition be heard at the Patent Office, on Monday, the 6th of August next, at 12 o'clock, M. ; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing ; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 26th of July ; depositions, and other papers relied upon as testimony, must be filed in the office on or before the morning of that day ; the arguments, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C. ; Daily Republican, Baltimore ; Pennsylvanian, Philadelphia, Pa. ; Scientific American, New York, and Post, Boston, Mass., once a week for three successive weeks previous to the 6th day of August next, the day of hearing.

S. T. SHUGERT,
Acting Commissioner of Patents.

P. S.—Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 35 3

Science and Art.

Meat Fly.

The large, buzzing meat-fly, named *Musca (Calliphora) vomitoria*, is of a blue-black color, with a broad, dark blue, and hairy hind body. It is found all summer about slaughter-houses, butchers' stalls, and pantries, which it frequents for the purpose of laying its eggs on meat. The eggs are commonly called fly-blows; they hatch in two or three hours after they are laid, and the maggots produced from them come to their growth in three or four days, after which they creep away in into some dark crevice, or burrow in the ground, if they can get at it, turn to egg-shaped pupæ, and come out as flies, in a few days more; or they remain unchanged through the winter, if they have been hatched late in the summer. A smaller fly, of a brilliant blue-green color, with black legs, also lays its eggs on meat, but more often on dead animals in the fields.–[Pennsylvania Farm Journal.

The above article from our contemporary on the production of flies, brings to our remembrance, the statement made by Prof. Bedford, M. D., of this city, and published in the American *Lancet* for April last, page 12,

He says, "if we are to abide by the testimony of observers, it seems undoubtedly proved that *spontaneous* generation is possible, and experiments have satisfactorily demonstrated, that living beings may originate without the previous deposit of ova. Animalculæ for example, will spring from putrefaction, etc."

We believe Professor Bedford is in error, in asserting that living beings originate spontaneously without the egg. He cannot, we are confident, produce good authority, to sustain his opinions. We know they are opposed to those of Dr. Burnett, on the reproduction of viviparous aphididæ.

Electricity and Gravitation.

Professor Faraday says that we are on the verge of important discoveries concerning the nature of physical forces, and their relation to life and physiology. He expressed an opinion that all "forces" have a similar dual property, and that even "gravitation" will be ultimately determined to possess it. One force cannot be called into action in electricity without the other, and they are always equal. When the north poles of four powerful magnets are placed together at right angles, so as to form a deep square cell, in the centre of that cell there is no magne tic attraction at all. The "northness" and "southness" of a magnet, Professor Faraday, in conclusion, said, took place in curved lines outside, not inside a magnet—an opinion somewhat similar to that held by Newton as regarded gravitation.

[The above is from an interesting lecture recently delivered at the Royal Institution, London, by Dr. Faraday; taken in connec tion with the subject of "Attraction" and the probable Suspension of Gravitation, by Septimus Piesse, and which has given rise to some discussion in our columns, the remarks of the learned professor possess further interest.

Lunar Eclipse.

Observations of the Lunar Eclipse, May 1st, 1855 at William's College Observatory:

	H.	M.	S.
First contact (sidereal time) - -	11	57	34
" " (mean solar) - -	9	20	26
Disappearance (sidereal time) -	13	1	27
Reappeaaance " " -	14	37	33
" (mean solar) - -	12	0	13
Last contact with shadow (sidereal time - - - - - - - - -	15	41	2
Transit of the Sun - - - -	2	32	29

During the total obscuration, the satelite occulted two little stars in Virgo, which appeared one to the naked eye.

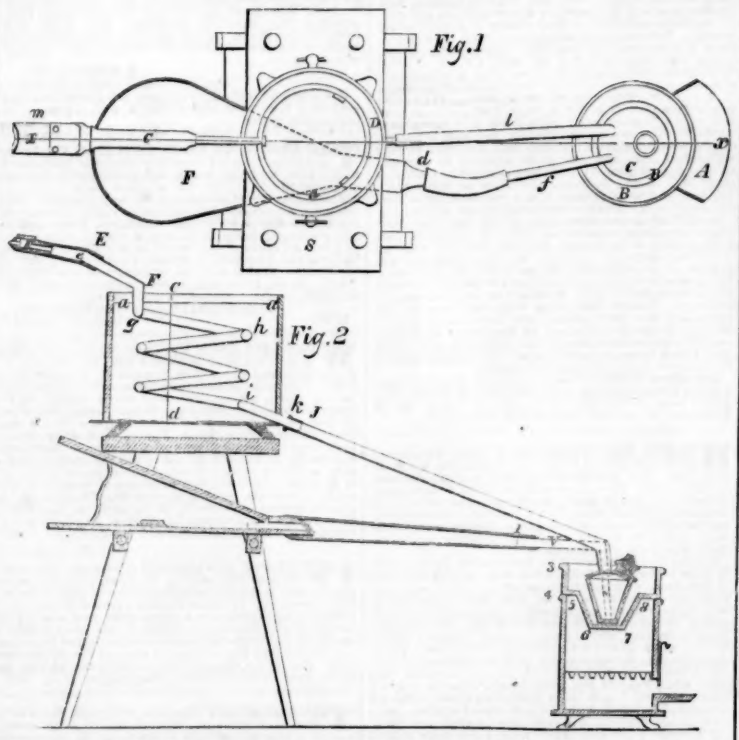
An Immense Breakwater.

The Chicago and Rock Island Railroad Company are preparing to erect a vast breakwater in the Mississippi, just above and adjoining the great center pier, on which will swing the draw on the railroad bridge. This breakwater will require about 506,000 feet of lumber and 13,000 yards of rock for its construction. It is intended for the great draw to rest upon when swung around; the upper end of it is for a house to be built upon for the draw-keeper to reside in, and for an ice-breaker and breakwater. Its huge dimensions will defy the storm and floods.

New Railroad Telegraph.

Cavaliere Bonelli (the director of the telegraphs in the kingdom of Sardinia) has commenced experiments with his newly-invented "locomotive telegraph," wherewith he professes to communicate from a train in motion with any station on the line, or with another train on the line. The great advantages to the world at large from the success of such an invention, are at once so obvious, that the result of the experiment is naturally looked for with with much anxiety. —[London Mining Journal and Railway Gazette.

MEDICAL INSPIRATOR.



The accompanying figure represents a medical inhaling apparatus, for which a patent was granted to Samuel H. T. Tilghman, of Snow Hill, Maryland, on the 21st of last November.

Fig. 1 is a top view of the inspirator, and fig. 2 is an elevated vertical section on the line, *x x*, fig. 1. A, fig. 1, is a portable furnace. B is a vessel of water, in which is contained a distilling medicating vessel, C, containing herbs, or any other drug or substance, the vapor or gas from which is to be inhaled. F is a bellows, situated on a stand, S. *f* is the tube of the pipe of the bellows connected to the nozzle, *d*. D is a refrigerator or cooler of cold water, in which is a worm, *a a*, which has its pipe, *l*, inserted into the distilling vessel, C. *m* is a mouth-piece with a valve in it, and *c* is the tube of the mouth-piece connected with the worm, *a a*. The patient inhales by this mouth piece the vapor or gas passing up from vessel, C, through the worm in the cooler.

Figure 2 shows the bellows, having a metallic tube, V, dipping into the vessel, C, and descendi g near to its bottom, as shown by the dotted lines. There is a valve on the nozzle of the bellows, to prevent any of the liquid ascending into the bellows. The furnace is eight inches in diameter, and eight inches from the top to the grate. The top end of the pipe at E is 39 inches high. The dimensions of the rest of the apparatus are from 3 to 4=3 inches, from 4 to 5=2 inches, from 5 to 6=3 inches, and from 6 to 6=3½ inches. From *a* to *a* (cooler)=14 inches, from C to *d*=11 inches deep, from *e* to F =5 inches, from *g* to *h*=10 inches, from *i* to *k* at joint J=6 inches. The length of the tube, J, to its bend above the medicating vessel in the furnace, is 27½ inches. The vessel containing the medicating herbs, or other drugs, has a plug for putting in the substances in the vessel, and for cleaning it out.

The herbs, or other drugs, are distilled, or gas generated therefrom, in the vessel, C, by the heat in the furnace. The vapor, or the gas ascends through the tube into the worm of the cooler, where it is cooled, and as much of the moisture in it as possible is condensed. The patient, therefore, inhales a comparatively dry vapor when herbs are the substances used for medication.

It is not necessary always to use the valve mouth-piece, *m*; indeed it may be entirely dispensed with by the patient inhaling from a common tube connected with the upper end of the worm.

The use of the bellows is for persons of very weak lungs, to force air gently through the vessel, C, and up through the cooler.

The object of the apparatus is to furnish medicated air in a comparatively dry state, to persons having diseased lungs and to assist the respiration of the patients.

More information may be obtained by letter addressed to the patentee, at Snow Hill, Worcester Co., Md.

(For the Scientific American.)

The New American Manufacture of Metalic Ware.

I observed an article in your last week's number, in reference to a paper read by Dr. W. H. Smith of this city, before the Royal Academy of Sciences in England, in reference to the utility of converting the slag of iron furnaces into things useful and ornamental. Having had business transactions with him in this city, in the way of encouraging his invention before he left for Europe, I thought it might not be uninteresting to your readers to know how he succeeded with his experiments while here. After securing his patents he commenced operations at Conshohocken, Mont'y Co., Pa., by undertaking to convert the slag of a large anthracite furnace at that place, into paving tile, glassware, &c. For this purpose he built annealing ovens and fixed other necessary fixtures to carry on the business. These, till after having been cast and annealed, were taken to Philadelphia. They were then ground smooth on the one surface and were ready for use. I had a foot way laid with them in this city, the only one ever laid by him, which has been in use for about two and a half years, and answers a pretty good purpose. The great difficulty that he met with was, that a great many of them broke in annealing, and many others had fire flaws in them, making them unfit for use. This material as manufactured by Mr. Smith, was too brittle, partaking too much of the character of brittle glass. The desideratum seemed to be a something that would make it less brittle. I saw some beautiful colored glass ware made by him of this material, it was too expensive to be brought into practical use. If the difficulty of the fire cracks and the brittleness of the material; could be overcome by some of our men of genius, then this material would become of incalculable benefit to the world. It takes a much higher polish than marble and is much handsomer. It would make a most splendid article for mantels, table tops, &c.

E. R. Norny.

Philadelphia, May 7th, 1855.

St. Louis Mechanics' Institute.

From the Annual Report of the above association, published in the Louisville *Courier*, we learn that it is in a prosperous condition. The Library contains 4,300 volumes, 375 being added during the past year. This association has a fine reading room supplied with a great number of magazines and papers. It numbers 1,179 members, (more, we believe, than the New-York Mechanics' Institute). Its receipts for the year amounted to $8,749, and its expenditure were $8,656. It has an excellent Board of Managers, able and faithful officers; has done wonders for the few short years of its existance; does credit to the mechanics of that city, and deserves the respect and countenance of all its citizens.

Worcester Mechanics Institute.

A Committee of this Association has reported in favor of building a new hall for a library, reading, and lecture room, at a cost of $60,000. The reserved funds of the Association amount to $22,000. They propose to issue bonds for the extra amount required